



# **Air Quality Permitting Technical Memorandum**

November 4, 2002

**Tier II Operating Permit and Permit to Construct  
No. 001-00107**

**MOTIVEPOWER, INC., BOISE**

**Project No. T2-010039**

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**FINAL PERMIT**

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## ACRONYMS, UNITS AND CHEMICAL NOMENCLATURE

ACFM	Actual Cubic Feet Per Minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
BACT	Best Available Control Technology
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Idaho Department of Environmental Quality
dscf	dry standard cubic feet
EF	Emissions Factor
EPA	United States Environmental Protection Agency
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
IDAPA	Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MACT	Maximum Available Control Technology
MMBtu	million British thermal units
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
O <sub>3</sub>	ozone
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of 10 micrometers or less
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
SCC	Source Classification Code
scf	standard cubic feet
SM	Synthetic Minor
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
TSP	Total Suspended Particulates
T/yr	tons per year
µm	micrometers
VOC	volatile organic compound

## PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 400 et seq. and 200 et seq., *Rules for the Control of Air Pollution in Idaho*.

## PROJECT DESCRIPTION

The scope of this project is the issuance of a facility-wide permit to MotivePower, Inc. (MPI) located in Boise, Idaho. The permit is required to resolve past failures to obtain permits to construct (PTCs) for some emissions units at the facility and according to the compliance plan in the Tier I permit. The facility-wide permit will be issued after issuance of the Tier I permit and will incorporate the following: (1) federally enforceable emissions limits, establishing the facility's potential to emit (PTE) and operating parameters, (2) PTC-related emissions/process requirements that, when met, assure compliance with National Ambient Air Quality Standards (NAAQS) and applicable increments for toxic air pollutants (TAPs), and (3) monitoring and maintenance requirements to assure that emissions control equipment is properly operated and achieves claimed efficiencies. The facility-wide permit will put MPI's facility in compliance with PTC requirements for the time period following the date of issuance of the permit. The requirements of the facility-wide Tier II Operating Permit and Permit to Construct will then be incorporated into the Tier I permit.

There are a number of emissions units at the facility that currently have PTCs. This permit will incorporate all existing PTCs that were previously issued to MPI. Allowable emissions existing in these PTC sources are carried over into the Tier II Operating Permit and Permit to Construct and are used in the modeling analyses.

Facility-wide conditions are included in the permit. The following emissions units are incorporated in this permit and:

- Two natural gas-fired boilers;
- New large paint shop (this source was permitted by the Department of Environmental Quality (DEQ) in 1994);
- New strip-wash-blast-painting building (this source was permitted by DEQ in 1998);
- Old large-paint shop;
- Small-paint shop;
- MPI bead blast enclosures (3 total);
- Compressor test stand engine;
- Locomotive engine test cell stand;
- Spray paint booth;
- Truck and Engine Annex (TEA) bead blast enclosures (2 units);
- Shot blast booth;
- Panel master arc metal cutter.

The above emissions units and their associated air pollution control equipment and the stack parameters are described in either the operating permit or Tier II permit application.

## FACILITY DESCRIPTION

MotivePower, Incorporated (MPI) is located in Boise, Idaho. MPI's general nature of business is the remanufacture and maintenance of locomotives. The facility has two locations in Boise: the MPI facility on Apple Street and the TEA on Braniff Street. MPI-Apple Street and the TEA are a single facility with respect to air permitting. The remanufacturing process at MPI-Apple Street involves cleaning (degreasing) the

locomotives, followed by total disassembly; electrical and mechanical testing and qualification of component parts for reuse; rebuilding of the components that fail the testing and qualification procedures; reassembling the locomotive; completion of final testing; and shipment back to the customer.

The remanufacturing process at the MPI-Apple Street facility is highly variable and depends upon the requirements of each individual customer and the condition of each locomotive. Various work operations include welding, cutting, grinding, bead blasting, electrical wiring, mechanical assembly, spray painting, and locomotive testing.

The TEA facility remanufactures locomotive trucks (wheel assembly, locomotive support, and propulsion unit) and a locomotive diesel engine for MPI-Apple Street, in addition to other customers outside MPI-Apple Street remanufacturing contracts. The remanufacturing process for the trucks and diesel engines at the TEA follows the general overall procedure as for locomotives at MPI-Apple Street. The trucks and engines are brought to the shop, cleaned, and disassembled; the component parts are mechanically inspected and requalified for reuse; components failing inspection are rebuilt; and finally, the trucks and engines are reassembled, tested, and shipped to the customer or to MPI-Apple Street.

As with the MPI-Apple Street facility, the remanufacturing of trucks and engines depends upon customer requirements and the condition of the various engine and truck components. Therefore, work operations are similar to those of the MPI-Apple Street facility, and include welding, torch cutting, grinding, machining, abrasive blasting, mechanical assembly, spray painting, and engine testing.

## **SUMMARY OF EVENTS**

On February 21, 2001, DEQ sent a letter to MPI requesting the company submit a compliance plan for the sources that were constructed without a PTC prior to construction.

On May 9, 2001, DEQ received from MPI the Tier II permit application and modeling protocol.

On July 17, 2001, MPI received a PTC modification for the relocation of the locomotive EERTF.

On September 13, 2001, DEQ received a facility-wide Tier II permit application from MPI.

On October 30, 2001, the facility-wide Tier II permit application was declared complete by DEQ.

On November 28, 2001, MPI sent a letter to DEQ requested to relocate the compressor test stand engine from the TEA site to MPI Apple Street site.

On March 15, 2002, the Tier I operating permit was made available to public comment through April 15, 2002. MotivePower provided comments on the Tier I operating permit. These comments and the DEQ responses are included in Appendix C of this memo.

On June 24, 2002, DEQ released the draft Tier II operating permit to MPI for a 10-day review.

On July 29, 2002, DEQ received comments from MotivePower on the facility draft permit.

On August 3, 2002, DEQ determined to include Tier II requirements into the Tier I for permit efficiency purposes.

On August 23, 2002, the Tier II operating permit was made available for a second public comment period through September 23, 2002. No comments were received during the second public comment period.

On September 23, 2002, A public hearing regarding the Tier II operating permit was held at DEQ.

## DISCUSSION

### 1. Emissions Estimates and Applicability

Emissions estimates were provided by MPI in the Tier II permit application that was submitted to DEQ on September 13, 2001. Some emissions estimates were included in the Tier I operating permit additional information requested from MPI and received by DEQ on August 24, 2000. Table 1 and Table 2 in Appendix A of this memo contain a summary of emissions rates for the criteria air pollutants, TAPs, and the hazardous air pollutants (HAPs). Other related calculations are shown in Appendix A of this memo. Emissions limits in pounds per hour (lb/hr) and tons per year (T/yr) for the pollutants emitted from sources at the facility are presented in the permit. Detailed emissions estimates for all the permitted emissions units are included in MPI's Tier II permit application.

Emissions calculations submitted within the application and the additional requested information were checked for accuracy. These submittals provided the basis for the emissions limits that are incorporated in the operating permit and for the NAAQS analyses.

A restriction on production rates of 150 locomotives per year at the MPI-Apple Street site and 200 engines and 200 truck sets per year at the TEA site are included in the permit. The locomotive production limits at the MPI facility were determined based on information submitted in the Tier II permit application and also based on many meetings and correspondence between DEQ staff and MPI's staff and their consultants.

According to the Tier II permit application, each MPI site has physical limits of the existing shops and equipment, and the integrated processes and an inner-dependent flow through manner of operation which limit the facility to these production rates.

The TEA site produces trucks and locomotive engines for other customers, and therefore has a different and larger per engine and truck unit production capability and capacity than the MPI-Apple Street site has for locomotive production. In addition, client/contract specifications regarding engine testing (engine test cell) at TEA-Apple Street differ from locomotive engine testing (load box) requirements at the MPI-Apple Street facility. The time required to load, mobilize, manifold, test, de-manifold, and unload an engine for testing at the TEA site takes about two days each to complete; therefore, testing is limited to 200 engines per year. Locomotive teardown and/or new frame setup, blast, prime, assembly/reassembly, initial checkout, and subsequent teardown/new frame setup requires about 2.5 days per locomotive. This restricts locomotive production at the MPI-Apple Street site to 150 locomotives per year.

MPI calculated the PTE for the emissions units at the facility by using several different methods depending on the particular emissions unit. As described in the Tier II permit application, the following methods and assumptions are used by MPI to estimate the PTE:

- The PTE for many small quantity emissions units, such as most natural gas combustion units and shot blasting at the SWBP building, was calculated by assuming continual operation of 8,760 hours per year.
- The PTE is calculated based on the maximum production rate of 150 locomotives per year at the MPI-Apple Street site and 200 engine and 200 truck sets at the TEA site.
- The PTE calculations for the EERTF were based on the allowable emissions in the PTC that was issued to the facility on July 17, 2001.
- The PTE calculations for the permitted painting operations at the MPI-Apple Street site are based on the PTC's limits that were issued to the facility on October 18, 1994 and on August 17, 1998. The PTE for the unpermitted painting booth operations at the MPI-Apple Street site are

based on a restricted amount of paints in order to limit the VOC emissions to below the prevention of significant deterioration (PSD) threshold limits.

- The PTE for the TEA paint booth, TEA shot blast booth, and miscellaneous solvent usage at the MPI-Apple Street site is calculated by using emissions associated with a known usage under a known site-wide production rate and the ratio of the potential production rate to the rate associated with the known usage.

According to DEQ-approved permitting/modeling protocol (see Appendix A), the natural gas-fired combustion sources with a maximum heat input capacity of 1.0 MMBtu/hr or less were not included in the emissions calculations because emissions from these sources are considered negligible compared to other emissions sources at the facility. Subsequently, no modeling was performed for these sources. Also, any source at the facility that has an emissions rate equivalent to a 1.0 MMBtu/hr natural gas-fired combustion unit is not included in the atmospheric dispersion modeling.

In the MPI's Tier II permit application that was submitted to DEQ on September 30, 2001, the compressor test stand engine emissions were not included in the modeling analysis because its emissions are less than that of 1.0 MMBtu/hr natural gas-fired combustion unit. However, on November 28, 2001, MPI submitted to DEQ a request for concurrence of a PTC exemption from permitting requirements for relocating the compressor test stand engine from the TEA site to the MPI Apple Street site, in accordance with IDAPA 58.01.01.222.02.d (fuel-burning equipment with a capacity less than 1.0 MMBtu/hr heat input). For DEQ to concur with the exemption, the compressor test stand engine must demonstrate that the relocation will not cause or significantly contribute to a violation of an ambient air quality standard, per IDAPA 58.01.01.220.01.a.iii.

The compressor test stand engine has a maximum capacity of 130 horsepower (hp). DEQ performed the modeling analysis for emissions from the diesel engine when operating continuously at its maximum capacity and at its new location. The model indicated that the PM<sub>10</sub> and NO<sub>x</sub> emissions from the diesel engine exceeds levels defined as a significant contribution, per IDAPA 58.01.01.006.93. However, when the diesel engine is operated only to power the compressor test stand, the PM<sub>10</sub> and NO<sub>x</sub> emissions will not cause or significantly contribute to a violation to the ambient air quality standards. Therefore, it is recommended that operation of the diesel engine must be limited to powering the compressor test stand. For more information on the modeling of emissions from the compressor test stand engine, please refer to the modeling memorandum by Mr. Kevin Schilling of DEQ in Appendix B of this memo.

According to the DEQ-approved permitting/modeling protocol, toxic air pollutant (TAP) emissions increases are assessed for sources constructed at MPI facilities after July 1, 1995 (the date when the TAP regulations were promulgated). As defined in IDAPA 58.01.01.007.06.c., "The increase in toxic air pollutant emissions from already operating or permitted source is not included in the calculation of the net emissions increase for a proposed new source or modification if i. the already operating or permitted source commenced construction or modification prior to July 1, 1995." Emissions sources constructed after July 1, 1995, at MPI facility include: SWBP paint booth, SWBP blast booth, engine emissions reduction test stand, one of the TEA bead blast enclosure, Max O Tube-Therm Burner, and air-sparge treatment. Appendix A of this memo provides the emissions estimates for non-carcinogenic and carcinogenic TAPs from the entire facility. Hourly emissions rates were calculated by dividing the daily non-carcinogenic TAP emissions rate by 24 or the annual carcinogenic TAP emissions rate by 8,760. TAP increases since July 1995 were included in the net emissions increase calculation, as per IDAPA 58.01.01.007.06.c.

It should be noted that emissions associated with the locomotive load box testing conducted at the MPI Apple Street site are not included in this permit. Load box testing involves monitoring locomotive engine performance and auxiliary equipment and parts while the locomotive is attached to a "load box" that provides load to the locomotive. Locomotives tested are fully assembled.

IDAPA 58.01.01.222.02.e exempts "mobile internal combustion engines, marine installations, and locomotives" from stationary source permitting requirements. Also, United States Environmental Protection Agency (EPA) Region 10 determined that these sources meet the definition of a mobile source – please refer to Appendix A of this memo for the EPA applicability determination regarding the load box. Mobile sources are not subject to PTC or permit requirements. These sources are also excluded from consideration in the dispersion modeling assessment. From an air quality standpoint, the impact of these sources is accounted for in the pollutant background concentrations.

However, the locomotive engine test cell stand located at the TEA site is different than that of the load box at the MPI-Apple Street site. The locomotive engine is physically removed from the locomotive and is mounted on a stationary stand for testing purposes; therefore, it is considered a stationary source. Thus, the locomotive engine test cell stand is not considered a mobile source and it is subject to stationary source requirements. Emissions from the locomotive engine test cell stand are included in Table 1, Appendix A of this memo.

As with the EERTF in Apple Street, IDAPA 58.01.01.675 (fuel burning equipment – particulate matter) does not apply to the locomotive engine test cell at the TEA facility. Fuel burning equipment is defined in IDAPA 58.01.01.006.41 as "any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer." The primary purpose of the locomotive engine test cell is to test the locomotive engines and not to produce heat or power. Therefore, IDAPA 58.01.01.675 is not applicable to the locomotive engine test cell.

However, a valid argument can be made that a locomotive hooked up to the "grid" does have the primary purpose to produce power and could be considered fuel burning equipment under stationary source rules. It should be noted that the PTC for EERTF is terminated because it is shutdown.

As indicated in the permit application page 33, paints containing cadmium or chromium will not be used at new SWBP building.

Therefore, it is stated in the Tier II Operating Permit and Permit to Construct, Condition 5.5 that "paints containing cadmium or chromium shall not be used at the SWBP building, as per the applicant submittal."

Particulate matter (PM) emissions rates that are incorporated in PTC No. 001-00107 from the new large-paint shop (issued in 1994) are not included in this permit. However, PM<sub>10</sub> emissions rates are included in the permit. The PM<sub>10</sub> emissions inherently limit the PM emissions. Also, the PM PTE does not trigger any new source review requirements.

## 2. Modeling

A modeling demonstration to determine compliance with NAAQS was submitted by MPI in the Tier II permit application. Modeling of all emissions units at the facility is necessary to demonstrate that the stationary source from the entire MPI facility would not cause or significantly contribute to a violation of any ambient air quality standard, as per IDAPA 58.01.01.403. According to DEQ-approved permitting/modeling protocol, any emissions unit at the MPI facility which has an emissions rate that is equivalent to that of 1.0 MMBtu/hr natural-gas fired combustion unit is not included in the modeling for this permit. However, PM<sub>10</sub> and NO<sub>x</sub> emissions from the compressor test stand engine are included in the modeling analysis in order to meet the requirements of IDAPA 58.01.01.222.02.d. All emissions units that are incorporated in this permit and those emissions units that are considered insignificant and/or exempt from permitting are included in the ambient air assessment, unless otherwise indicated in Appendix B, Table 3 of this memo.

MPI used the ISC-3-Prime (ISC-3P) model, an approved regulatory model, to assess the ambient air quality impacts and some TAP increments. Pollutants modeled are PM<sub>10</sub>, NO<sub>x</sub>, CO, SO<sub>2</sub>, and some applicable TAPs. All applicable TAP sources at the MPI facilities are modeled together to demonstrate compliance with TAP increments.

Maximum background pollutant concentrations were added to the modeled values to determine NAAQS compliance. Background concentration values are included in Table 4, Appendix B. Please note that ambient background levels are not added to the CO modeled concentrations because the area is nonattainment for that pollutant. MPI cannot have an ambient impact for CO that exceeds that defined as a significant contribution as per IDAPA 58.01.01.006.93. The CO significant contribution value is 2,000 ug/m<sup>3</sup> for a 1-hour average and 500 ug/m<sup>3</sup> for an 8-hour average.

Dispersion modeling results indicate that PM<sub>10</sub>, NO<sub>x</sub>, and SO<sub>2</sub> emissions from the operations at MPI will meet all applicable NAAQS and TAP increments. Carbon monoxide emissions from MPI will meet the applicable significant contribution requirements – see Tables 5 and 6, Appendix B.

Table 2, Appendix A provides a modeling summary for the TAP emissions from the sources that were constructed at MPI after July 1, 1995. As shown in Table 2, only benzene, cadmium, chromium-VI, 1,1 dichloroethane, 1,1 dichloroethylene, formaldehyde, methylene chloride, nickel, and PAHs were identified as requiring a refined modeling analysis using the ISCST model because the potential emissions rates did not meet the screening emissions levels (EL) values as listed in IDAPA 58.01.01.586. Table 6 in Appendix B provides a modeling summary for the TAP emissions for the above carcinogenic pollutants. This modeling summary table shows that all TAP emissions from the modeled sources demonstrate compliance with the acceptable ambient concentration requirements.

There are two Sellers boilers at MPI. The dispersion modeling is conducted for emissions from one boiler. According to MPI, the boilers' stacks are located next to each other and one of the boilers is considered a back-up boiler.

Therefore, it was necessary to include Permit Condition 3.4 in the permit, which states that 'the boilers shall not operate simultaneously.'

See Appendix B to review DEQ's modeling memo by air quality modeler Mr. Yayi Dong.

### 3. Area Classification

The facility is not a designated facility as defined in IDAPA 58.01.01.006.25. The facility is located within Air Quality Control Region 64 and UTM Zone 11. MPI is located in Boise, Idaho, Ada County. The area is designated as nonattainment for CO. The classification for PM<sub>10</sub> is not determined; however, it has been decided by the DEQ Boise Regional Office that the area will be treated as unclassified for PM<sub>10</sub> for minor sources and minor modification.

### 4. Facility Classification

This facility is classified as major in accordance with IDAPA 58.01.01.008.10, for Tier I permitting due to a PTE for NO<sub>x</sub> and VOCs of over 100 T/yr, each. Hazardous Air Pollutants (HAPs) from xylene emissions are greater than 10 T/yr. The facility is also major as defined in IDAPA 58.01.01.006.55, but is not subject to Prevention of Significant Deterioration (PSD) permitting requirements. The PTE for each regulated air pollutant for which the area is designated as attainment or unclassifiable from MPI (Apple Street and TEA sites) was below 250 T/yr, the PSD threshold level before the construction of the EERTF in 2000. Therefore, MPI was not a PSD major facility. For PSD to have been applicable for the EERTF when constructed in 2000, modification emissions from the EERTF itself must have been greater than 250 T/yr. The NO<sub>x</sub> permitted

emissions from the EERTF are 141 T/yr, which is less than 250 T/yr, the PSD threshold level. However, after the addition of the EERTF to MPI, potential NO<sub>x</sub> emissions exceeded 250 T/yr. Future modifications that have PTE greater than levels defined as significant (IDAPA 58.01.01.006.92) will trigger PSD requirements for the modifications. The facility is classified as A and the standard industrial classification is 3743.

The facility is not a designated facility, as defined in IDAPA 58.01.01.006.27. The facility is not subject to federal New Source Performance Standards in accordance with 40 CFR 60, federal National Emission Standards for Hazardous Air Pollutants in accordance with 40 CFR 61, or federal Maximum Achievable Control Technology standards in accordance with 40 CFR 63.

## 5. Regulatory Review

This operating permit is subject to the following permitting requirements:

- IDAPA 58.01.01.401 Tier II Operating Permit
- IDAPA 58.01.01.403 Permit Requirements for Tier II Sources
- IDAPA 58.01.01.404.01(c) Opportunity for Public Comment
- IDAPA 58.01.01.404.04 Authority to Revise or Renew Operating Permits
- IDAPA 58.01.01.405 Conditions for tier II Operating Permits
- IDAPA 58.01.01.406 Obligation to Comply
- IDAPA 58.01.01.407 Tier II Operating Permit Processing Fees
- IDAPA 58.01.01.625 Visible Emissions Limitation
- IDAPA 58.01.01.650 General Rules for the Control of Fugitive Dust
- IDAPA 58.01.01.677 Particulate Matter Standards for Fuel Burning Equipment for Minor and Existing Sources
- IDAPA 58.01.01.728 Distillate fuel Oil

6. AIRS

**AIRS/AFS<sup>a</sup> FACILITY-WIDE CLASSIFICATION<sup>b</sup> DATA ENTRY FORM**

AIR PROGRAM POLLUTANT <sup>c</sup>	SIP <sup>c</sup>	PSD <sup>d</sup>	NSPS <sup>e</sup> (Part 60)	NESHAP <sup>f</sup> (Part 61)	MACT <sup>g</sup> (Part 63)	TITLE V <sup>h</sup>	AREA CLASSIFICATION A = Attainment U = Unclassifiable N = Nonattainment
SO <sub>2</sub> <sup>h</sup>	B					B	A
NO <sub>x</sub> <sup>i</sup>	A					A	A
CO <sup>j</sup>	B					B	N
PM <sub>10</sub> <sup>k</sup>	B					B	U
PT (Particulate) <sup>l</sup>	B					B	U
VOC <sup>m</sup>	A					A	U
THAP (Total HAPs) <sup>n</sup>	A					A	U
			APPLICABLE SUBPART				

<sup>a</sup> Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

<sup>b</sup> AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

<sup>c</sup> State Implementation Plan

<sup>d</sup> Prevention of Significant Deterioration

<sup>e</sup> New Source Performance Standards

<sup>f</sup> National Emission Standards for Hazardous Air Pollutants

<sup>g</sup> Maximum Achievable Control Technology

<sup>h</sup> Sulfur Dioxide

<sup>i</sup> Nitrogen Oxides

<sup>j</sup> Carbon Monoxide

<sup>k</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>l</sup> Particulate Matter

<sup>m</sup> Volatile Organic Compounds

<sup>n</sup> Hazardous Air Pollutants

## FEES

Tier II processing fees in accordance with IDAPA 58.01.01.407 became effective July 1, 2002. However, because MPI submitted their Tier II operating permit application on September 13, 2001, the appropriate Tier II fees which were in effect at the time of permit processing was in accordance with IDAPA 58.01.01.470. Therefore, the facility is subject to permit application fees for this Tier II operating permit of \$500.00 which was paid on August 8, 2002.

## RECOMMENDATIONS

Based on review of the application materials and all applicable state and federal regulations, staff recommends that DEQ issue a Tier II operating permit and Permit to Construct to MotivePower, Inc., located in Boise, Idaho. An opportunity for public comment on the air quality aspects of the proposed Tier II permit was provided in accordance with IDAPA 58.01.01.404.01.c.

HE/sm

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cc: Mike McGown, Boise Regional Office  
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## **APPENDIX A**

### ***Emission Rates Tables and Calculations***

***MotivePower, Inc., Boise***

**TABLE -1**  
**Emission Totals (ton/yr)**

Emission Source	PM	PM-10	NO <sub>x</sub>	CO	SO <sub>2</sub>	VOC	lead
New Large Paint Shop	0.748	0.496				40.0	
New Large Paint Shop heater	0.130	0.130	1.72	1.44	1.03 E-2	0.169	8.6 E-6
Old Large Paint Shop	0.936	0.616				40.0	
Small Paint Shop	0.292	0.193				12.5	
TEA Paint Booth	0.181	0.119				7.73	
SWBP Shot Blasting	0.937	0.134					1.44 E-4
SWBP Painting	5.12 E-2	3.36 E-2				21.8*	
SWBP Heater	0.147	0.147	1.93	1.62	1.16 E-2	0.212	9.68 E-6
TEA Shot Blast Booth	9.57	1.37					1.47 E-3
EERTF	2.39	2.39	141	18.0	10.9	2.92	
TEA Engine Test Cell	2.84	2.84	112	11.8	7.98	6.48	
Bead Blast Units (5)	0.136	6.55 E-2					
TEA PROCECO Parts Washer	8.16 E-2	8.16 E-2	1.07	0.902	6.44 E-3	0.118	5.37 E-6
Locomotive Shop Boiler	0.219	0.219	2.88	2.42	1.73 E-2	0.317	1.44 E-6
Locomotive Shop Steam Cleaner	3.39 E-2	3.39 E-2	0.447	0.375	2.68 E-3	4.91 E-2	2.23 E-6
Small Paint Shop Steam Cleaner	3.39 E-2	3.39 E-2	0.447	0.375	2.68 E-3	4.91 E-2	2.23 E-6
Component Shop Furnace	6.53 E-2	6.53 E-2	0.859	0.722	5.15 E-3	9.45 E-2	4.29 E-6
Maxom Tube-O-Therm	6.53 E-2	6.53 E-2	0.859	0.722	5.15 E-3	9.45 E-2	4.29 E-6
Panel Master Arc Metal Cutler	0.198	0.198	2.46				
Misc. Solvent Use						33.9	
<b>TOTAL EMISSIONS</b>	<b>19.1</b>	<b>9.23</b>	<b>266</b>	<b>38.4</b>	<b>18.9</b>	<b>166</b>	<b>1.67E-3</b>

\* Thinner VOCs are not considered here since they are accounted for by Misc. Solvent Use

TABLE -2

## TAP Analysis

Non-Carcinogenic TAP	Emission Sources	lb/hr Emission Rate	TAP lb/hr EL	Modeling Required
zinc	SWBP Heater	1.28 E-4 (1.61 E-5 g/sec)		
	Tube-O-Therm	5.69 E-5 (7.16 E-6 g/sec)		
	Total	1.85 E-4	0.333	No
Carcinogenic TAPs	Emission Sources	lb/hr Emission Rate	TAP lb/hr EL	Modeling Required
acetaldehyde	EERTF	2.52 E-5	3.0 E-5	no
arsenic	SWBP Heater	8.82 E-7 (1.11 E-7 g/sec)		
	Tube-O-Therm	3.92 E-7 (4.94 E-8 g/sec)		
	Total	1.27 E-6	1.5E-6	No
benzene	SWBP paint booth	0.0150 (1.89 E-3 g/sec)		
	SWBP Heater	9.26 E-6 (1.17 E-6 g/sec)		
	EERTF	4.65 E-3 (5.86 E-4)		
	Tube-O-Therm	4.12 E-6 (5.19 E-7 g/sec)		
	Total	1.97 E-3	8.0 E-4	Yes
beryllium	SWBP Heater	<5.29 E-8 (6.67 E-9 g/sec)		
	Tube-O-Therm	<2.35 E-8 (2.96 E-9 g/sec)		
	Total	<7.64 E-8	2.6 E-5	No
cadmium	SWBP Blast	6.58 E-6 (8.30 E-7 g/sec)		
	SWBP Heater	4.85 E-6 (6.11 E-7)		
	Tube-O-Therm	2.16 E-6 (2.72 E-7 g/sec)		
	Total	1.36 E-5	3.7 E-6	Yes
chromium (6+)	SWBP Blast	1.29 E-6 (1.63 E-7 g/sec)	5.6 E-7	Yes
1,1 dichloroethane	GW/Treat	4.11 E-4 (5.18 E-5 g/sec)	2.5 E-4	Yes
1,2 dichloroethane	GW/Treat	1.25 E-5	2.5 E-4	No
1,1 dichloroethylene	GW/Treat	2.98 E-4 (3.72 E-5 g/sec)	1.3 E-4	Yes
formaldehyde	SWBP Heater	3.31 E-4 (4.17 E-5 g/sec)		
	EERTF	4.73 E-4 (5.96 E-5 g/sec) <sup>a</sup>		
	Tube-O-Therm	1.47 E-4 (1.85 E-5 g/sec)		
	Total	9.51 E-4	5.1 E-4	Yes
methylene chloride	SWBP paint booth	0.0260 (3.15 E-3 g/sec)	1.6 E-3	Yes
Nickel	SWBP Blast	2.59 E-5 (3.26 E-6 g/sec)		
	SWBP Heater	9.26 E-6 (1.17 E-6 g/sec)		
	Tube-O-Therm	4.12 E-6 (5.19 E-7 g/sec)		
	Total	3.93 E-5	2.7 E-5	Yes
PAHs	SWBP Heater	<5.03 E-8 (6.34 E-9 g/sec)		
	EERTF	2.70 E-5 (3.40 E-6 g/sec) <sup>a</sup>		
	Tube-O-Therm	<2.24 E-8 (<2.82 E-9 g/sec)		
	Total	2.71 E-5	8.16 E-6	Yes
tetrachloroethylene	GW/Treat	4.96 E-5	1.3 E-2	No
1,1,2 trichloroethane	GW/Treat	4.17 E-6	4.2 E-4	No
trichloroethylene	GW/Treat	2.28 E-5	5.1 E-4	No

<sup>a</sup> Emission rates used for dispersion modeling are different than these hourly average emissions rates because the source only operates a maximum of 10 hr/day during specific time periods. The emission rates used for modeling are provided in Section 9.4.

TABLE -2

## TAP Analysis

Non-Carcinogenic TAP	Emission Sources	lb/hr Emission Rate	TAP lb/hr EL	Modeling Required
acetone	SWBP paint booth	1.56 (0.197 g/sec)	119	No
acrolein	EERTF	4.72 E-5 (5.95 E-6 g/sec)	0.017	No
barium	SWBP paint booth	0.0122 (1.53 E-3 g/sec)		
	SWBP Heater	1.94 E-5 (2.45 E-6 g/sec)		
	Tube-O-Therm	8.63 E-6 (1.09 E-6 g/sec)		
	Total	0.0122	0.033	No
2-butoxyethyl acetate	SWBP paint booth	7.82 (0.985 g/sec)	8.33	No
n-butyl acetate	SWBP paint booth	7.82 (0.985 g/sec)	47.3	No
tert-butyl acetate	SWBP paint booth	7.82 (0.985 g/sec)	63.3	No
n-butyl alcohol	SWBP paint booth	7.82 (0.985 g/sec)	10	No
chromium (3+)	SWBP Blast	2.59 E-5 (3.26 E-6 g/sec)	0.033	No
	SWBP Heater	6.18 E-6 (7.78 E-7 g/sec)		
	Tube-O-Therm	2.75 E-6 (3.46 E-7 g/sec)		
	Total	3.48 E-5		
cobalt	SWBP Heater	3.71 E-7 (4.67 E-8 g/sec)		
	Tube-O-Therm	1.65 E-8 (2.06 E-9 g/sec)		
	Total	3.88 E-7	0.0033	No
copper	SWBP Heater	3.75 E-6 (4.72 E-7 g/sec)		
	Tube-O-Therm	1.67 E-6 (2.10 E-7 g/sec)		
	Total	5.42 E-6	0.013	No
dichlorobenzene	SWBP Heater	5.29 E-6 (6.67 E-7 g/sec)		
	Tube-O-Therm	2.35 E-6 (2.96 E-7 g/sec)		
	Total	7.64 E-6	20	No
2-ethoxyethanol	SWBP paint booth	7.82 (0.985 g/sec)	1.27	Yes
ethyl benzene	SWBP paint booth	7.82 (0.985 g/sec)	29	No
hexane	SWBP paint booth	7.82 (0.985 g/sec)		
	SWBP Heater	7.94 E-3 (1.00 E-3 g/sec)		
	Tube-O-Therm	3.53 E-3 (4.45 E-4 g/sec)		
	Total	7.83	12	No
isopropyl alcohol (anhydrous)	SWBP paint booth	1.56 (0.197 g/sec)	65.3	No
manganese	SWBP Blast	7.76 E-6 (9.78 E-7 g/sec)		
	SWBP Heater	1.68 E-6 (2.11 E-7 g/sec)		
	Tube-O-Therm	7.45 E-7 (9.39 E-8 g/sec)		
	Total	1.02 E-5	0.333	No
mercury	SWBP Heater	1.15 E-6 (1.45 E-7 g/sec)		
	Tube-O-Therm	5.10 E-7 (6.42 E-8 g/sec)		
	Total	1.66 E-6	0.003	No
methyl n-amyl ketone	SWBP paint booth	7.82 (0.985 g/sec)	15.7	No
methyl ethyl ketone	SWBP paint booth	7.82 (0.985 g/sec)	39.3	No
methyl isobutyl ketone	SWBP paint booth	7.82 (0.985 g/sec)	13.7	No
methyl methacrylate	SWBP paint booth	7.82 (0.985 g/sec)	27.3	No
molybdenum	SWBP Heater	4.85 E-6 (6.11 E-7 g/sec)		
	Tube-O-Therm	2.16 E-6 (2.72 E-7 g/sec)		
	Total	7.01 E-6	0.333	No
naphthalene	SWBP Heater	2.69 E-6 (3.39 E-7 g/sec)		
	EERTF	7.79 E-4 (9.82 E-5 g/sec)		
	Tube-O-Therm	1.20 E-6 (1.51 E-7 g/sec)		
	Total	7.83 E-4	3.33	No
pentane	SWBP Heater	1.15 E-2 (1.45 E-3 g/sec)		
	Tube-O-Therm	5.10 E-3 (6.42 E-4 g/sec)		
	Total	1.66 E-2	118	No
propylene glycol monomethyl ether	SWBP paint booth	9.37 (1.18 g/sec)	24	No
selenium	SWBP Heater	1.10 E-7 (1.39 E-8 g/sec)		
	Tube-O-Therm	4.71 E-8 (5.93 E-9 g/sec)		
	Total	1.57 E-7	0.013	No
toluene	SWBP paint booth	7.82 (0.985 g/sec)		
	SWBP Heater	1.50 E-5 (1.89 E-6 g/sec)		
	EERTF	1.68 E-3 (2.12 E-4 g/sec)		
	Tube-O-Therm	6.67 E-6 (8.40 E-7 g/sec)		
	Total	7.82	25	No
vanadium	SWBP Heater	1.01 E-5 (1.28 E-6 g/sec)		
	Tube-O-Therm	4.51 E-6 (5.68 E-7 g/sec)		
	Total	1.46 E-5	0.003	No
xylene	SWBP paint booth	9.37 (1.18 g/sec)		
	EERTF	1.16 E-3 (1.46 E-4 g/sec)		
	Total	9.37	29	No

### Summary of Potential HAP Emissions

Xylene is the primary HAP potentially emitted from the MPI facility. Material submitted from MPI on September 6, 1996 (MPI was MK Rail Corporation at that time) indicated the following "highest concentrations of HAPs" in paints typically used: Methyl Ethyl Ketone - 5 percent by weight; Xylene - 15 percent by weight; Toluene 2 percent by weight. Thinners used were estimated to have a maximum of 25 percent by weight Xylene. Total emissions were based on allowable paint application rates in existing permits or as specified in this application.

<b>New Large Paint Shop</b>			
16,000 gal	13 lb paint	0.15 lb Xylene	= 31,200 lb Xylene
yr	gal	lb paint	yr
<b>Old Large Paint Shop</b>			
16,000 gal	13 lb paint	0.15 lb Xylene	= 31,200 lb Xylene
yr	gal	lb paint	yr
<b>Small Paint Shop</b>			
5,000 gal	13 lb paint	0.15 lb Xylene	= 9,750 lb Xylene
yr	gal	lb paint	yr
<b>TEA Paint Shop</b>			
3,000 gal	13 lb paint	0.15 lb Xylene	= 5,850 lb Xylene
yr	gal	lb paint	yr
<b>SWBP Building</b>			
8,750 gal	13 lb paint	0.15 lb Xylene	= 17,063 lb Xylene
yr	gal	lb paint	yr
<b>SWBP Thinner Use</b>			
1,750 gal	7.5 lb	0.25 lb Xylene	= 3,281 lb Xylene
yr	gal	lb thinner	yr
<b>TOTAL</b>			= 98,344 lb Xylene      49 ton Xylene
		yr	yr

This emission estimate is a significant overestimation of potential emissions because it is based on allowable VOC emissions from each paint booth, and the sum of potential emissions from each individual paint booth is far greater than actual or reasonable potential xylene emissions from the MPI facility. A more reasonable estimate of potential xylene emissions was made on the basis of actual 1994 emissions, 1994 production values, and an estimate of future potential production.

In 1994 approximately 8.31 E+3 gal of paint were utilized at the MPI Apple St. site. During this year, the MPI Apple St. site production was 105 locomotives. The maximum potential production at the Apple St. site is 150 locomotives per year. Using a typical paint density of 5.0 lb/gal and a typical xylene content of 15 percent, the following xylene emission was calculated for paint use at the Apple St. site:

8.31 E+3 gal (94)	5.0 lb	0.15 lb xylene	150 loco (potential)	=	8.90 E+3 lb xylene
yr	gal	lb paint	105 (1994)		yr

## At the TEA

approximately 2.20 E+3 gal of paint were used during 1994 for 121 engines and 93 trucks (214 units). With an estimated potential production of 300 units, the potential xylene emissions from painting operations is:

2.20 E+3 gal (94)	5.0 lb	0.15 lb xylene	300 units (potential)	=	2.31 E+3 lb xylene
yr	gal	lb paint	214 (1994)		yr

Xylene is also present in paint thinners. In 1994, about 3,000 gal of lacquer thinner and 1,000 gal of mineral spirit thinner was used. With a typical density of 7 lb/gal, the following was emitted to the atmosphere:

$\frac{(3,000 \text{ gal} + 1,000 \text{ gal})}{\text{yr}}$	$\frac{7.0 \text{ lb}}{\text{gal}}$	$\frac{0.25 \text{ lb xylene}}{\text{lb thinner}}$	$\frac{150 \text{ loco (potential)}}{105 (1994)}$	$=$	$\frac{1.00 \text{ E+4 lb xylene}}{\text{yr}}$
---	-------------------------------------	--	---	-----	--

total potential Xylene emissions are:

$$\frac{8.90 \text{ E+3 lb}}{\text{yr}} + \frac{2.31 \text{ E+3 lb xylene}}{\text{yr}} + \frac{1.00 \text{ E+4 lb xylene}}{\text{yr}} = \frac{2.12 \text{ E+4 lb xylene}}{\text{yr}} = \frac{10.6 \text{ ton xylene}}{\text{yr}}$$

potential xylene emission of 10.6 ton/yr is considerably less than the 49 ton/yr based on allowable permitted levels, and represents a more realistic estimate of facility-wide xylene emissions.

From: <Bray.Dave@epamail.epa.gov>  
To: "MacClarence, Bill" <Bill\_MacClarence@envircon.sta...  
Date: 3/5/01 12:12 PM  
Subject: RE: Request for Assistance

Actually, this situation is analogous to the situation with jet engine test cells. When the locomotive engine is physically removed from the locomotive and mounted on a stationary test stand, then it is part of a stationary source and must be permitted as such. However, when the entire locomotive is driven into a load box, and the engine is tested in situ, then it is considered to be a mobile source and not subject to stationary source requirements (as is a jet plane in a test cell).

I hope that this helps to answer the question regarding treatment of locomotive load boxes.

David C. Bray  
Senior Air Pollution Scientist  
Office of Air Quality, R10  
(206) 553-4253

"MacClarence, Bill"  
<Bill\_MacClarence@envircon.st  
ate.ak.us>  
03/02/2001 11:44 AM  
To: "Cannone, Bob"  
<Bob\_Cannone@envircon.state.ak.us>,  
"roseannwishner@earthlink.net"  
<roseannwishner@earthlink.net>  
cc: "Bowden, Jim"  
<Jim\_Bowden@envircon.state.ak.us>, Dave  
Bray/R10/USEPA/US@EPA, Jim Greaves/R10/USEPA/US@EPA  
Subject: RE: Request for Assistance

This sounds a lot like the crane in Dutch Harbor that was mounted on a rail.

The rail was a couple hundred feet long but the crane movement was restricted to this. We thought the whole thing should be treated as a stationary source. Dave Bray of EPA Region 10 ruled that the generators contained in the crane were "non-road engines" since they could move, albeit only a couple hundred feet back and forth.

> -----Original Message-----

> From: Cannone, Bob  
> Sent: Friday, March 02, 2001 9:10 AM  
> To: MacClarence, Bill  
> Cc: Bowden, Jim  
> Subject: FW: Request for Assistance

EPA Region  
10

## **APPENDIX B**

### ***Modeling Results***

***MotivePower, Inc., Boise***

**TABLE - 3**  
**Sources Included in the Tier II OP Analyses**

Source	Location	Exempt or Insignificant	Included in Dispersion Modeling	Existing Permit
<b>MPI Apple Street</b>				
Old Paint Shop	Apple St	No	Yes	No
Small paint shop	Apple St	No	Yes	No
New Paint Shop	Apple St	No	Yes	Yes
Strip, Wash, Blast, and Prime Bldg Paint Booth	Apple St	No	Yes	Yes
Strip, Wash, Blast, and Prime Bldg Shot Blast Booth	Apple St	No	Yes	Yes
Engine Emission Reduction Test Facility	Apple St	No	Yes	Yes
Fab. Shop, Component Shop, and Locomotive Shop Bead Blasting	Apple St	Yes	Yes	NA <sup>a</sup>
Locomotive Shop Boiler (6.7 MMBTU/hr)	Apple St	Yes	Yes	NA <sup>a</sup>
Locomotive Shop and Small Paint Shop Steam Cleaner Boilers	Apple St	Yes	Yes	NA <sup>a</sup>
Misc Natural Gas heaters (10 > MMBTU/hr < 1)	Apple St	Yes	Yes	NA
Misc Natural Gas heaters (<1 MMBTU/hr)	Apple St	Yes	No	NA
Panel Master	Apple St	Yes	Yes	NA
Emergency Generators at Pumphouse and HR Bldg	Apple St	Yes	No	NA
Max O Tube - Therm Burner	Apple St	Yes	Yes	NA
Air-Sparge Treatment	Apple St	Yes	Yes	NA <sup>a</sup>
<b>TEA</b>				
Engine Test cell	TEA	No	Yes	No
Paint Booth	TEA	No	Yes	No
Shot Blast Booth	TEA	No	Yes	No
Bead Blasting (2 units)	TEA	Yes	Yes	NA <sup>a</sup>
Compressor Test Stand	TEA	Yes	Yes	No
Misc Natural Gas heaters (10 > MMBTU/hr < 1)	TEA	Yes	Yes	NA
Misc Natural Gas heaters (<1 MMBTU/hr)	TEA	Yes	No	NA
<sup>a</sup> A PTC was not required as per correspondence with IDEQ				

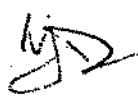
TABLE - 4 Background Pollutant Concentrations		
Pollutant	Averaging Time	Background Concentration ( $\mu\text{g}/\text{m}^3$ )
PM-10	24-hour	123
	annual	31.6
CO	1-hour	Not applicable
	8-hour	Not applicable
NO <sub>2</sub>	annual	40
SO <sub>2</sub>	3-hour	374
	24-hour	120
	annual	18.3

TABLE - 5 Dispersion Modeling Results					
Pollutant	Averaging Period	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ )	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Modeled + Background ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )
PM-10	24 hr	26 (2 <sup>nd</sup> highest)	123	149	150 not exceeded more than once
	annual	5.7 (highest)	31.6	37	50 not to be exceeded
NO <sub>2</sub>	annual	56.0 (highest) <sup>a</sup>	40	96	100 not to be exceeded
CO	1 hr	600 (highest)	NA	NA	2,000 (significant contribution)
	8 hr	361 (highest)	NA	NA	500 (significant contribution)
SO <sub>2</sub>	3 hr	303 (2 <sup>nd</sup> highest)	374	677	1,300 not exceeded more than once
	24 hr	58 (2 <sup>nd</sup> highest)	120	178	365 not exceeded more than once
	annual	5.6 (highest)	18.3	24	80 not to be exceeded
Lead	quarterly	0.016 (highest) <sup>b</sup>	0.0	0.021	1.5 not to be exceeded
<sup>a</sup> Obtained by multiplying model results by 0.75 as described in Section 16.7.2. <sup>b</sup> Used 24 hr modeling result to demonstrate compliance with quarterly standard					

TABLE - 6 TAP Modeling Results		
TAP	Modeled Concentration ( $\mu\text{g}/\text{m}^3$ )	AACC ( $\mu\text{g}/\text{m}^3$ )
benzene	0.116	0.12
cadmium	6 E-5	5.6 E-4
chromium 6+	1 E-5	8.3 E-5
1,1 dichloroethane	5.6 E-3	3.8 E-2
1,1 dichloroethylene	4.0 E-3	2.0 E-2
formaldehyde	3.9 E-3	7.7 E-2
methylene chloride	0.19	0.24
nickel	1.4 E-4	4.2 E-3
PAHs	5 E-6	3.0 E-4

## MEMORANDUM

TO: Harbi Elshafei, State Office of Technical Services

FROM: Yayi Dong, State Office of Technical Services 

SUBJECT: Modeling Review for the Tier II Operating Permit Application; MotivePower Inc., Boise, Idaho

DATE: January 7, 2002

---

### 1. SUMMARY:

Washington Group International, Inc., on behalf of the MotivePower Inc. (MPI), submitted a Tier II operating permit (Tier II) application for the facility in Boise, Idaho. This application is required according to a compliance plan in the Tier I permit. The Tier II application addresses all pollutants on a facility-wide basis. The criteria pollutants of concern for this facility are particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>), oxides of nitrogen (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), and lead (Pb). There are no ambient air quality standards for toxic air pollutants (TAPs) for use in Tier II permitting actions. However, under IDAPA 58.01.01.161, the Department of Environmental Quality (DEQ) will ensure that any TAP "shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation." The Tier II permitting process requires those emissions, on a facility wide basis, that exceed the screening emission level presented in IDAPA 58.01.01.585 and .586 be modeled. For this facility, the following TAPs were identified: benzene, Cadmium, chromium 6+, 1,1 dichloroethane, 1,1dichloethylene, formaldehyde, methylene chloride, nickel, and PAHs. The modeling results provided by Washington Group International, Inc. were used to calculate the cumulative risk by DEQ staff, the analysis demonstrated compliance with all regulatory requirements and the quantities of TAPs emissions were determined to not unreasonably affect human or animal life or vegetation.

### 2. DISCUSSION:

#### **2.1 Process Description**

The Motive Power facility, for the permitting purposes, includes both the Apple Street site and the Truck and Engine Annex (TEA) site. The Apple Street site primarily manufactures and re-manufactures diesel and electric locomotives. It also provides overhaul and maintenance work on locomotives. The TEA re-manufactures locomotive trucks and locomotive diesel engines for Apple Street site and also for other customers. The methods used in both sites include welding; the torch cutting; grinding; machining; steel shot and glass bead blasting; mechanical assembly; and spray painting. The emissions data are in Table 1 through Table 5. Stack parameters are also included in these tables. The codes of stacks in the tables are identical as used in the ISC3 modeling. DEQ has approved to exclude 3 blast booths at Apple St. site and 2 blast booths at the TEA site from the modeling, since the controlled emission rate of these sources is less than the emission rate equivalent to the 1.0 MMBTU/hr natural gas boiler. These sources will be permitted as controlled sources.

10/10/10  
10/10/10

Table 1. Source parameters and emission rates for 1-hour averaging period

Source	UTM <sup>1</sup> East (meter)	UTM North (meter)	Base elevation (meter)	Stack Height (meter)	Temp (K) <sup>2</sup>	Exit Velocity (m/s) <sup>3</sup>	Stack Diameter (meter)	CO <sup>4</sup> (g/s) <sup>5</sup>	SO <sub>2</sub> <sup>6</sup> (g/s)
ENGTEST2	567265	4823038	878.1	13.7	561	20.8	0.6	2.77E+00	1.23E+00
NEWPT1	566970	4822872	876.9	11.9	300	0.1	0.9	1.04E-02	7.41E-05
NEWPT2	566973	4822880	876.9	11.9	300	0.1	0.9	1.04E-02	7.41E-05
NEWPT3	567026	4822865	877.8	11.9	300	0.1	0.9	1.04E-02	7.41E-05
NEWPT4	567023	4822856	877.9	11.9	300	0.1	0.9	1.04E-02	7.41E-05
SWBPB	567286	4823018	878.1	2.1	293	19.5	1.0	4.67E-02	3.34E-04
BOILER1	567335	4822863	879	4.9	478	19.8	0.5	6.95E-02	4.97E-04
SMPTBOIL	567187	4822957	877.2	1.8	366	0.08	0.4	1.08E-02	7.71E-05
LOCOSB	567316	4822812	881.5	9.8	366	0.07	0.4	1.08E-02	7.71E-05
MAXTUBE	567313	4822799	882.5	2.1	311	10.7	0.2	2.59E-02	1.85E-04
AENGTEST	568130	4822340	892.2	6.1	597	26.7	0.6	1.85E+00	1.26E+00
COMPHEAT	567185	4822892	878.1	8.6	436	5.8	0.4	2.08E-02	1.48E-04
APROCECO	568077	4822404	893.1	4.9	400	4.1	0.3	2.59E-02	1.85E-04

1. Universal Transverse Mercator coordinates
2. Degrees Kelvin
3. Meters Per Second
4. Carbon monoxide
5. Gram per second
6. Sulfur dioxide, 3-hour average was modeled by using 1-hour average emission rates.

Table 2. Source parameters and emissions rates for 24-hour averaging period

Source ID	UTM <sup>1</sup> East (meter)	UTM <sup>1</sup> North (meter)	Base Elevation (Meter)	Stack Height (Meter)	Temp (K) <sup>2</sup>	Exit Velocity (m/s) <sup>3</sup>	Stack Diameter (Meter)	CO <sup>4</sup> (g/s) <sup>5</sup>	SO <sub>2</sub> <sup>6</sup> (g/s)	Lead (g/s)	PM <sub>10</sub> <sup>7</sup> (g/s)
ENGTEST1	567265	4823038	878	13.7	597	30.0	0.6	3.14E-00	1.43E-00		2.66E-01
OLDPT1	566987	4822836	878	9.4	300	0.1	0.9	0	0		4.66E-03
OLDPT2	566987	4822843	878	9.4	300	0.1	0.9	0	0		4.66E-03
OLDPT3	567031	4822843	878	8.2	300	0.1	0.9	0	0		4.66E-03
OLDPT4	567031	4822836	878	8.2	300	0.1	0.9	0	0		4.66E-03
NEWPT1	566970	4822872	877	11.9	300	0.1	0.9	1.04E-02	7.41E-05	6.18E-08	4.67E-03
NEWPT2	566973	4822880	877	11.9	300	0.1	0.9	1.04E-02	7.41E-05	6.18E-08	4.67E-03
NEWPT3	567026	4822865	878	11.9	300	0.1	0.9	1.04E-02	7.41E-05	6.18E-08	4.67E-03
NEWPT4	567023	4822856	878	11.9	300	0.1	0.9	1.04E-02	7.41E-05	6.18E-08	4.67E-03
SWBPP1	567280	4823007	878	11.4	293	0.1	0.9	0	0		5.07E-04
SWBPP2	567283	4823015	878	10.7	293	0.1	0.9	0	0		5.07E-04
SWBPB	567286	4823018	878	2.1	293	19.5	1.0	4.67E-02	3.34E-04	4.43E-06	8.07E-03
SMALLPT1	567178	4822972	877	7.0	293	0.1	1.2	0	0		9.32E-03
SMALLPT2	567186	4822972	877	7.0	293	0.1	1.2	0	0		9.32E-03
BOILER1	567335	4822863	879	4.9	478	19.8	0.5	6.95E-02	4.97E-04	4.14E-07	6.29E-03
BOILER2	567335	4822866	879	9.8	366	0.02	0.4	0	0		0
SMPTBOIL	567187	4822967	877	1.8	366	0.08	0.4	1.08E-02	7.71E-05	6.42E-08	9.76E-04
LOCOSB	567316	4822812	882	9.8	366	0.07	0.4	1.08E-02	7.71E-05	6.24E-08	9.76E-04
PANELMAS	567106	4823050	877	13.1	328	0.09	0.2	0	0		8.33E-03
MAXTUBE	567313	4822799	883	2.1	311	10.7	0.2	2.59E-02	1.85E-04	1.54E-07	2.35E-03
AENGTEST	568130	4822340	892	6.1	597	30.0	0.6	1.85E-00	5.24E-01		1.86E-01
APAIINT	568056	4822395	893	10.7	293	0.1	1.1	0	0		8.11E-03
ASHOTB	568036	4822377	892	4.6	293	15.1	0.6	0	0	4.23E-05	3.93E-02
COMPHEAT	567185	4822892	878	8.6	436	5.9	0.4	2.08E-02	1.48E-04	1.24E-07	1.88E-03
APROCECO	568077	4822404	893	4.9	400	4.1	0.3	2.59E-02	1.85E-04	1.54E-07	2.35E-03

1. Universal Transverse Mercator coordinates
2. Degrees Kelvin
3. Meters per second
4. Carbon monoxide
5. Gram per second
6. Sulfur dioxide
7. particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

Table 3. Source parameters and emissions rates for annual averaging period

Source	UTM <sup>1</sup> East (meter)	UTM North (meter)	Base Elevation (meter)	Stack Height (meter)	Temp (K) <sup>2</sup>	Exit Velocity (m/s) <sup>3</sup>	Stack Diameter (meter)	NO <sub>x</sub> <sup>4</sup> (g/s) <sup>5</sup>	SO <sub>x</sub> <sup>4</sup> (g/s)	PM <sub>10</sub> <sup>7</sup> (g/s)
ENGTEST2	567265	4823038	878.1	13.7	561	20.8	0.6	1.52E+01	1.23E-00	2.1E-01
OLDPT1	566987	4822836	878	9.4	300	0.1	0.9	0	0	4.44E-03
OLDPT2	566987	4822843	877.6	9.4	300	0.1	0.9	0	0	4.44E-03
OLDPT3	567031	4822843	878.1	8.2	300	0.1	0.9	0	0	4.44E-03
OLDPT4	567031	4822836	878.2	8.2	300	0.1	0.9	0	0	4.44E-03
NEWPT1	566970	4822872	876.9	11.9	300	0.1	0.9	1.24E-02	7.41E-05	4.49E-03
NEWPT2	566973	4822880	876.9	11.9	300	0.1	0.9	1.24E-02	7.41E-05	4.49E-03
NEWPT3	567026	4822865	877.8	11.9	300	0.1	0.9	1.24E-02	7.41E-05	4.49E-03
NEWPT4	567023	4822856	877.9	11.9	300	0.1	0.8	1.24E-02	7.41E-05	4.49E-03
SWBPP1	567280	4823007	878.1	11.4	293	0.1	0.9	0	0	4.86E-04
SWBPP2	567283	4823015	878.1	10.7	293	0.1	0.9	0	0	4.86E-04
SWBPPB	567286	4823018	878.1	2.1	293	19.5	1.0	5.56E-02	3.34E-04	8.07E-03
SMALLPT1	567178	4822972	876.9	7.0	293	0.1	1.2	0	0	2.78E-03
SMALLPT2	567186	4822972	877.2	7.0	293	0.1	1.2	0	0	2.78E-03
BOILER1	567335	4822863	879	4.9	478	19.8	0.5	8.28E-02	4.97E-04	6.29E-03
SMPTBOIL	567187	4822967	877.2	1.8	367	0.08	0.4	1.28E-02	7.71E-05	9.76E-04
LOCOSB	567316	4822812	881.5	9.8	367	0.07	0.4	1.28E-02	7.71E-05	9.76E-04
PANELMAS	567106	4823050	876.9	13.1	327	0.09	0.2	7.09E-02	0	5.71E-03
MAXTUBE	567313	4822799	882.5	2.1	311	10.7	0.2	2.47E-02	1.48E-04	1.88E-03
AENGTEST	568130	4822340	892.2	6.1	597	29.8	0.6	3.21E-00	2.30E-01	8.20E-02
APAIINT	568056	4822395	893.1	10.7	293	0.1	1.1	0	0	3.43E-03
ASHOTB	568036	4822377	892.2	4.6	293	15.2	0.6	0	0	3.90E-02
COMPHEAT	567184	4822892	878.1	8.6	436	5.9	0.4	2.47E-02	1.48E-04	1.88E-03
APROCECO	568077	4822404	893.1	4.9	400	4.1	0.3	3.09E-02	1.85E-04	2.35E-03

1. Universal Transverse Mercator coordinates
2. Degrees Kelvin
3. Meters per second
4. Nitrate oxides
5. Gram per second
6. Sulfur oxides
7. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

Table 4. TAP<sup>1</sup> source parameters (annual averaging)

Source	UTM <sup>2</sup> East (meter)	UTM North (meter)	Base Elevation (meter)	Stack Height (meter)	Temp (K) <sup>3</sup>	Exit Velocity (m/s) <sup>4</sup>	Stack Diameter (meter)
ENGTEST3	567265	4823038	878.1	13.7	530	16.9	0.60
SWBPP1	567280	4823007	878.1	11.4	293	0.1	0.90
SWBPP2	567283	4823015	878.1	10.7	293	0.1	0.91
SWBPPB	567286	4823018	878.1	2.1	293	19.5	0.95
MAXTUBE	567313	4822799	882.5	2.1	310	10.7	0.15
GWTRTAT	567124	4823102	876.3	6.1	293	2.2	0.05

1. Toxic air pollutants
2. Universal Transverse Mercator coordinates
3. Degrees Kelvin
4. Meters per second

Table 5. TAP<sup>1</sup> source emissions (g/s)

Source	Benzene	Cadmium	Chromium 6+	Formaldehyde	Methylene Chloride	1,1 dichloroethane	Nickel	PAHs	1,1 dichloroethylene
ENGTEST3	1.41E-03	0	0	1.43E-04	0		0	8.16E-06	
SWBPP1	9.42E-04	0	0	0	1.57E-03		0	0	
SWBPP2	9.42E-04	0	0	0	1.57E-03		0	0	
SWBPPB	1.17E-06	1.44E-06	1.63E-07	4.17E-05			4.43E-06	6.34E-09	
MAXTUBE	5.19E-07	2.72E-07	0	1.85E-05	0		5.19E-07	2.82E-09	
GWTRTAT						5.18E-05			3.72E-05
URF <sup>2</sup>	8.3E-06	1.8E-03	1.2E-02	1.3E-05	3.6E-06	2.6E-05	2.4E-04	3.3E-03	5.0E-05

1. Toxic air pollutants
2. Unit Risk Factor (IDAPA58.01.01.586)

## 2.2 Applicable Air Quality Impact Limits

MPI is located in Boise, Ada County, Idaho. There are two individual facilities that are located about one mile apart. The primary facility, located at 4600 Apple Street, is referred to as MPI Apple Street. The other facility is the TEA located at 2100 Braniff Street. Ada County is designated as a nonattainment area for all CO averaging periods and an attainment and unclassifiable area for all other criteria pollutants. The modeled CO ambient concentration increment cannot exceed the significant contribution, and if the increment(s) of any other regulated pollutant(s) in the list: SO<sub>2</sub>, PM<sub>10</sub> and NO<sub>2</sub>. Lead is (are) higher than the significant contributions, the appropriate background concentration is added to those ambient concentration increments to determine compliance to the National Ambient Air Quality Standards (NAAQS). The cumulative risk of TAPs is calculated according to the DEQ Modeling Guidance (to be published). The NAAQS are listed in Table 6. According to the DEQ's modeling guidance (to be published), the Cumulative Risk cannot exceed 1.0E-05.

Table 6. Applicable regulatory limits<sup>1</sup>

Pollutant	Averaging Period	Regulatory Limit (µg/m <sup>3</sup> ) <sup>2</sup>	Significant Contribution Level(µg/m <sup>3</sup> ) <sup>2</sup>
NO <sub>2</sub> <sup>3</sup>	Annual	100	NA
SO <sub>2</sub> <sup>4</sup>	3-hour	1,300	NA
	24-hour	375	NA
	Annual	80	NA
CO <sup>5</sup>	1-hour	NA <sup>7</sup>	2,000
	8-hour	NA <sup>7</sup>	500
PM <sub>10</sub> <sup>6</sup>	24-hour	150	NA
	Annual	50	NA

1. IDAPA 58.01.01.577
2. Micrograms per cubic meter
3. Nitrogen dioxide
4. Sulfur dioxide
5. Carbon monoxide
6. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
7. Since Ada County is a non-attainment area for CO (any time averaging period), the NAAQS is not applicable.

## 2.3 Background Concentrations

Table 7 is the background for regulated air pollutants. There are no background concentrations available for TAPs.

**Table 7. Background concentrations**

Pollutant	Averaging Period	Background Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>1</sup>
NO <sub>2</sub> <sup>2</sup>	Annual	40
SO <sub>2</sub> <sup>3</sup>	3-hour	374
	24-hour	120
CO <sup>4</sup>	Annual	18.3
	1-hour	NA <sup>5</sup>
	8-hour <sup>6</sup>	NA <sup>5</sup>
PM <sub>10</sub> <sup>8</sup>	24-hour	123
	Annual	31.6

1. Micrograms per cubic meter
2. Nitrogen dioxide
3. Sulfur dioxide
4. Carbon monoxide
5. Ada County is a non-attainment area for the all time period averaging CO, therefore, the 8-hour average cannot exceed 500  $\mu\text{g}/\text{m}^3$ , and the 1-hour average cannot exceed 2000  $\mu\text{g}/\text{m}^3$ .
6. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

## 2.4 Modeling Impact Assessment

ISC-3-Prime was used for this analysis. ISC3-Prime was selected over the model ISCST3 because of the importance of downwash for sources at MPI. Modeling was conducted using the front-end software BEEST for Windows, version 8.16. Meteorological data of 1987 through 1991 from Boise Airport were used. Environmental Protection Agency (EPA) default parameters for rural area were used. Receptors were set up according to the DEQ modeling guidance. Terrain data were also applied. All regulated air pollutants and the TAPs that exceeded the Emission Screening Levels were modeled. The concentrations of NO<sub>2</sub> were obtained by multiplying model results of NO<sub>x</sub> by 0.75 as described in Section 16.7.2 of the application. All SO<sub>x</sub> is considered as SO<sub>2</sub>. The analyses presented in the application demonstrate compliance with the requirements for Tier II sources, as required by IDAPA 58.01.01.403. The impact of TAPs was evaluated using Cumulative Risk. Cumulative Risk = sum of Risk. Risk = modeled concentration ( $\mu\text{g}/\text{m}^3$ ) x Unit Risk Factor (URF risk/( $\mu\text{g}/\text{m}^3$ )). The URF is listed in IDAPA58.01.01.586. The calculated Cumulative Risk is less than 1.0E-05. The results are summarized in Table 8 and 9.

**Table 8. Dispersion modeling results for regulated air pollutants**

Pollutant	Averaging Period	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>1</sup>	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Modeled + Background ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub> <sup>2</sup>	24 hr	26 (2 <sup>nd</sup> highest)	123	149	150 not exceeded more than once
	annual	5.7 (highest)	31.6	37	50 not to be exceeded
NO <sub>2</sub> <sup>3</sup>	annual	56.0 (highest) <sup>4</sup>	40	96	100 not to be exceeded
CO <sup>5</sup>	1 hr	600 (highest)	NA	NA	2,000 (significant contribution)
	8 hr	361 (highest)	NA	NA	500 (significant contribution)
SO <sub>2</sub> <sup>6</sup>	3 hr	303 (2 <sup>nd</sup> highest)	374	677	1,300 not exceeded more than once
	24 hr	58 (2 <sup>nd</sup> highest)	120	178	365 not exceeded more than once
	annual	5.6 (highest)	18.3	24	80 not to be exceeded
Lead	quarterly	0.016 (highest) <sup>7</sup>	0.0	0.021	1.5 not to be exceeded

1. Micrograms per cubic meter
2. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
3. Nitrogen dioxide
4. Obtained by multiplying model results by 0.75 as described in Section 16.7.2.
5. Carbon monoxide
6. Sulfur dioxide
7. Used 24-hr modeling result to demonstrate compliance with quarterly standard

Table 9. Dispersion modeling results for TAPs<sup>1</sup>

TAP	Modeled Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>2</sup>	URF <sup>3</sup>	Risk <sup>4</sup>
Benzene	0.116	8.3E-06	9.63E-07
Cadmium	6 E-5	1.8E-03	1.08E-07
chromium 6+	1 E-5	1.2E-02	1.20E-07
1,1 dichloroethane	5.6 E-3	2.6E-05	1.46E-07
1,1 dichloroethylene	4.0 E-3	5.0E-05	2.00E-07
Formaldehyde	3.9 E-3	1.3E-05	5.07E-08
methylene chloride	0.19	3.6E-06	6.84E-07
Nickel	1.4 E-4	2.4E-04	3.36E-08
PAHs	5 E-5	3.3E-03	1.65E-07
Cumulative Risk <sup>5</sup>			2.47E-06

1. Toxic air pollutants
2. Microgram per cubic meter
3. Acceptable ambient concentration for carcinogens increment
4. Unit Risk Factor, from US Environmental Protection Agency IDAPA 58.01.01.586
5. Risk = Concentration x URF
6. Cumulative Risk = sum of Risk, 1.0E-05 not to be exceeded

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